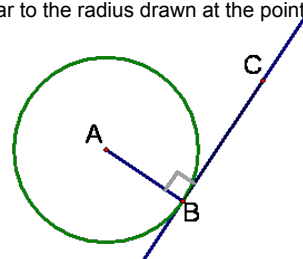


11-2 Properties of Tangents

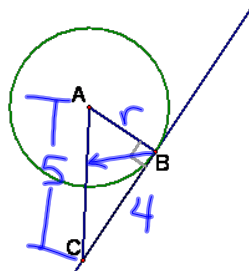
Theorem 11.1-If a line is tangent to a circle, then it is perpendicular to the radius drawn at the point of tangency.



Theorem 11.2-In a plane, if a line is perpendicular to the radius of a circle at its endpoint on the circle, then the line is tangent to the circle.

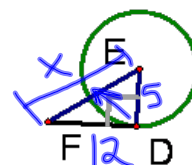
Find the radius if AC = 5 and BC = 4

$$\begin{aligned} c^2 &= a^2 + b^2 \\ 5^2 &= r^2 + 4^2 \\ 25 &= r^2 + 16 \\ -16 &\quad -16 \\ \hline \sqrt{9} &= \sqrt{r^2} \\ 3 &= r \end{aligned}$$



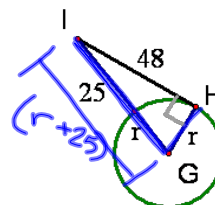
Find EF, if DE = 5 and DF = 12.

$$\begin{aligned} x^2 &= 5^2 + 12^2 \\ x^2 &= 25 + 144 \\ \sqrt{x^2} &= \sqrt{169} \\ x &= 13 \end{aligned}$$



$$\begin{aligned} (x+5)^2 &\quad \text{FOIL} \quad (x+7)^2 \\ (x+5)(x+5) &\quad (x+7)(x+7) \\ x^2 + 5x + 5x + 25 &\quad x^2 + 7x + 7x + 49 \\ x^2 + 10x + 25 &\quad x^2 + 14x + 49 \end{aligned}$$

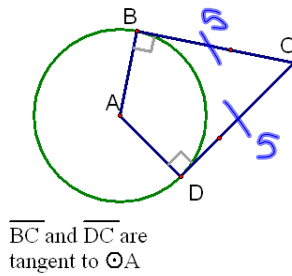
Find r.



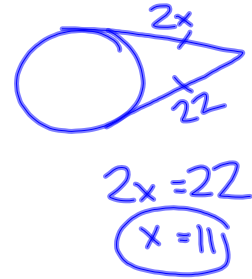
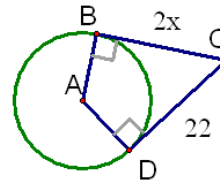
$$\begin{aligned} (r+25)^2 &= r^2 + 48^2 \\ (r+25)(r+25) &= r^2 + 2304 \\ r^2 + 25r + 25r + 625 &= r^2 + 2304 \\ r^2 + 50r + 625 &= r^2 + 2304 \\ 50r + 625 &= 2304 \\ -625 &\quad -625 \\ \hline 50r &= 1679 \\ \frac{50r}{50} &= \frac{1679}{50} \\ r &= 33.58 \end{aligned}$$

Theorem 11.3-If two segments from the same outside of a circle are tangent to the circle, then they are congruent.

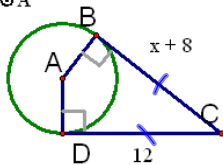
$$BC = DC$$



\overline{BC} and \overline{DC} are tangent to $\odot A$



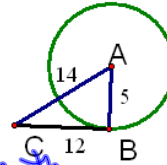
\overline{BC} and \overline{DC} are tangent to $\odot A$



$$x + 8 = 12$$

$$x = 4$$

Is \overline{CB} a tangent? No



Test pyth. thm.

$$14^2 \stackrel{?}{=} 5^2 + 12^2$$

$$196 \neq 25 + 144$$

$$196 \neq 169$$

HW

p598-599

4-13, 17, 20